

SUMMARY

The Dissertation is concerned with monitoring of changes regarding muscle involvement in specific areas of human motion system when walking and Nordic walking (NW) with focus on adults and by means of electromyography method.

Within the process of field testing there were 9 randomly selected individuals at the age of 50 – 60 tested to elicit differences in the motion system. There was an effort to find certain differences within involvement of specific muscle groups in the area of shoulder girdle, pelvic girdle and lower limbs and retrieval of similarities of coordination attributes concerning locomotion at horizontal presented by paradigm of kinesiological content of reflexive crawling according to Vojta's principle. Kinematic analyses was used to discover a difference in involvement of specific muscles between Nordic ($v = 5$ kph) and regular walking ($v = 4,75$ kph) up to 10° of ascent.

Muscles where their MVC was diagnosed the difference in individual muscle involvement was monitored expressed in percentage. The values found were consequently related to their referential value of MVC and tested by means of Wilcoxon test for dependent selection. Muscles where MVC value was not diagnosed the intraindividual comparative analyses of activation muscle pair similarity was carried out on the grounds of modified formulation of correlative function of two signals.

From results interpretation is obvious that during NW there is a contra lateral muscle connection of bottom part of a body with shoulder girdle (correlation of muscle activation m. deltoideus dx, p. scapularis, m. latissimus dorsi dx. p. transversa a m. gluteus maximus $> 0,7$), by which this newly formed string muscle will be strengthened and such strengthening will occur due to the effect of upper limbs involvement into locomotion. Based on the results it is evident that there is no significant decrease of lower limbs muscle activity during NW in comparison with walking (m. gluteus medius – $p = 0,678$, m. gastrocnemius $p = 0,327$). There is a significant increase of muscle activity only in connection with back muscles (m. latissimus dorsi $p = 0,011$), which is to regard as a positive result possible to use consequently as a prevention from vertebral problems that appear to be relatively frequent problem with individuals of this age.

We are able to conclude that there are not the same results during locomotion with sticks as with Vojta's reflexive crawling. Shoulder girdle does not take over antigravity function during NW but only engages in locomotion.